

GENERAL ECOLOGY—COURSE OUTLINE

Ecology is the study of how organisms interact with each other and their environment at the population, community, and ecosystem levels. The goal of this course is familiarize you with ecological theory and its applications.

Class Objectives: The main learning goals I hope you will all accomplish by the end of the quarter are:

- To gain an understanding of the broad biological significance of ecological theory.
- To gain an understanding of the questions that ecologists study, the methods they use, and the questions that remain unanswered.
- To develop your ability to apply quantitative skills to analyze and interpret ecological data.

Instructor:

Dr. Luis A. Ruedas

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Office hours by appointment

Course details:

Fall 2016; Biology 357: General Ecology (4 credits)

Academic & Student Rec Center, room 230

M/W/F 12:45–13:50

Reading material: Most reading assignments will be from the text or from supplemental reading material that I hand out in class. The required text is:

Ecology, 3rd edition (2014) by Cain, M. L., W. D. Bowman, and S. D. Hacker; you are welcome to get used copies of the text. Please read the assignments ahead of class.

Class time: We will use class time to integrate the ecological ideas from the readings into discussions. I will highlight the ecological ideas that I think are key and introduce ideas and terms that the text does not discuss. I will go over some of the definitions, but mainly you will be responsible for gaining definition of terms from the text. This will give us time in class to grapple with some of the more complex ideas of ecology, such as how to think about the natural world in an ecological context, how to design ecological experiments, and how to manipulate mathematical, ecological equations. I encourage you to ask questions during class, and I will ask you questions throughout the term for discussion. Please respect your classmates and do not monopolize discussion periods and please be polite during discussions. Students who fail to respect others during class time may have points deducted from their final score.

Exams: Exams will be short answer and/or multiple choice. Check the course schedule for the exam dates and bring conflicts to my attention immediately. Do not miss an exam! A makeup exam will not be given. Period. Honourable conduct is expected at all times.

Tentative lecture outline: This is likely to change as we go along!

Week	Date	Lecture	Topic	Chapter
1	9/26	1	Introduction	1
1	9/28	2	Evolutionary Ecology	6
1	9/30	3	Climatological and other physical factors	2
2	10/03	4	Physical factors and the Biosphere	2, 3
2	10/05	5	Climatological and other physical factors	4
2	10/07	6	Physiological Ecology: Adaptations to the physical environment	5
3	10/10	7	Physiological Ecology: Adaptations to the physical environment	5
3	10/12	8	Introduction to population distributions and abundance	9
3	10/14		Midterm I	
4	10/17	9	Population growth	10
4	10/19	10	Population growth and regulation	11
4	10/21	11	Life histories and demography; Reading: Ricklefs, Condor 102:9-22, 2000	7
5	10/24	12	Competition	12
5	10/26	13	Species interactions: predation	13
5	10/28	14	Species interactions – mutualism, herbivory	15
6	10/31	15	Species interactions – disease	14
6	11/02	16	Communities	16
6	11/04		Midterm II	
7	11/07	17	Community dynamics – succession	16, 17
7	11/09	18	Biogeography	18
7	11/11	19	Biodiversity and communities; BCI: What maintains biodiversity?	19
8	11/14		Random lecture on random topic (for now)	
8	11/16	20	Production and productivity	20
8	11/18	21	Energy flow in ecosystems; food webs	21
9	11/21	22	Nutrient cycling and biogeochemical cycles	22
9	11/23	23	Landscape ecology	24
9	11/25		Thanksgiving Holiday: University closed	
10	11/28	24	Ecosystem management	24
10	11/30	25	Conservation ecology, conservation biology	23
10	12/02	26	I likely will be behind schedule: <i>may</i> catch up here...!!!	
Final	12/05	12:30	Final: 12:30–14:20	

Grading System:

Midterm 1	200 pts	
Midterm 2	200 pts	
Homework	300 pts	[Due 2 December 2016; 1700h]
Final	200 pts	
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Total	800 pts	

Final grades will be based on a standard scale ($\geq 90\%$ = A, etc.)

The final exam will be on Monday 5 Dec from 12:30–14:20. The final exam will be cumulative.

Questions to consider now and again at the end of the quarter:

Can knowing the past history of population fluctuations in a species we care something about (such as salmon, endangered orchids, or humans) allow us to predict future trends for that species?

Given high levels of competition among organisms, why is every ecosystem not made up of only one or two species?

What ecological processes allow something as complex as a coral reef or a rainforest to exist?